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09/624,319	07/24/2000	John E. Smee	PA000343	6628

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Qualcomm Incorporated  
Patents Department  
5775 Morehouse Drive  
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EXAMINER

LIU, SHUWANG

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 07/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/624,319

**Applicant(s)**

SMEE ET AL.

**Examiner**

Shuwang Liu

**Art Unit**

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2000.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-40, 42-47, 51 and 52 is/are rejected.
- 7) ☒ Claim(s) 41 and 48-50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4, 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear what "equalizing and combining the one or more streams of samples **with an equalizer**" as recited in claims, for example, lines 7-8 of claim 1, means. It is well known that the equalizer performs equalization. The combining as recited in claims is only a part of equalization (equalizing). The equalization includes other steps, such as adaptive filtering, slicing et al. The equalizing is the final result of the equalizer.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application

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by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 1, 2, 4, 10,11, 13, 15, 17-25, 27 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Visotsky et al. (US 6,175,588) (whereby the combining is interpreted a part of steps within an equalizer).

As shown in figures 2-4, Visotsky et al. discloses a method for processing one or more signals in a spread spectrum communication system, the method comprising:

(1) regarding claim 1

receiving and processing the one or more signals to provide one or more streams of samples (202 in figure 2 and 420 in figure 4); and

first processing the one or more streams of samples to provide a first stream of recovered symbols (f204, 206, 240 et al. in figure 2), wherein the first processing includes

equalizing (204) and combining (inherently including the equalizer 204) the one or more streams of samples with an equalizer (204) to generate symbol estimates (236), and

processing (206 and 208) the symbol estimates to provide the first stream of recovered symbols.

(2) regarding claim 2

wherein the processing the symbol estimates includes  
despreading (206) the symbol estimates with a PN sequence to generate  
despread symbols (output from 206), and  
decovering (240) the despread symbols to generate the first stream of  
recovered symbols (output from 208).

(3) regarding claim 4:

second processing (203) the one or more streams of samples with one or more rake  
receiver to provide a second stream of recovered symbols (output from 262).

(4) regarding claims 10 and 28:

further comprising:

first adapting coefficients (column 19, lines 37-40 and lines 59-65 and column  
3, lines 42-65) of each of one or more filters within the equalizer, wherein one filter is  
operative to filter each of the one or more streams of samples; and second adapting  
one or more scaling factor used for the combining (inherently for the adaptive  
equalizer).

(5) regarding claim 11:

wherein the first adapting is performed for each filter based on filtered samples  
from the filter (lines 59-65 and column 3, lines 42-65).

(6) regarding claims 12 and 27:

wherein the first adapting is performed for the one or more filters based on the symbol estimates (lines 59-65 and column 3, lines 42-65).

(7) regarding claim 13:

wherein the coefficients of each filter are initialized to particular set of values (inherently).

(8) regarding claim 15:

wherein the first adapting attempts to minimize a mean square error between the symbol estimates and expected symbols (column 4, line 67)

(9) regarding claim 17:

slicing (inherently for equalizer) the symbol estimates to generates sliced symbol estimates.

(10) regarding claim 18:

wherein each filter within the equalizer is implemented as a finite impulse response (FIR) filter (column 3, lines 42-65).

(11) regarding claim 19:

wherein the first adapting is performed using time division multiplexed (TDM) pilot reference (column 3, lines 42-65 and column 9, line 24-column 10, line 46).

(12) regarding claim 20:

wherein the first adapting is performed using code division multiplexed (CDM) pilot reference (column 3, lines 42-65 and column 9, line 24-column 10, line 46).

(13) regarding claim 21:

wherein the first adapting is performed using a least mean square (LMS)

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algorithm (column 3, lines 42-65 and column 9, line 24-column 10, line 46).

(14) regarding claim 22:

wherein the first adapting is performed using a recursive least square (RLS) algorithm (column 3, lines 42-65 and column 9, line 24-column 10, line 46).

(15) regarding claim 23:

wherein the first adapting is performed using a direct matrix inversion (DMI) algorithm (column 3, lines 42-65 and column 9, line 24-column 10, line 46).

(16) regarding claims 24 and 25:

the combining is performed based on one or more scaling factor (inherently for the adaptive equalizer).

5. Claims 33-35, 38-40, 42-47, 51 and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by Serizawa et al. (US 5,283,531) (whereby the combining is interpreted a part of steps within an equalizer).

As shown in figures 3-6, 11-16 and 33-37, Serizawa et al. discloses a method for processing one or more signals in a communication system, the method comprising:

(1) regarding claim 33:

receiving and processing (112 and 114 in figure 5) the one or more signals to provide one or more streams of samples;

first processing (116 or 128) the one or more streams of samples to provide a first stream of recovered symbols, wherein the first processing includes

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equalizing (116 or 128) combining the one or more streams of samples with an equalizer to generate symbol estimates (see figures 11 and 33), and

processing (396 in figure 37) the symbol estimates to provide a first stream of recovered symbols;

second processing (118 or 130) the one or more streams of samples with one or more rake receivers to provide a second stream of recovered symbols;

estimating (120) a signal quality associated with each of the first and second processing; and

selecting (124 and 122) the first or second processing based on estimated signal qualities associated therewith.

(2) regarding claim 34:

further comprising:

adapting coefficients of each of one or more filters within the equalizer (figures 11 and 33).

(3) regarding claim 35:

wherein the coefficients of each filter within the equalizer are initialized using information derived from the one or more rake receiver (column 25, line 41-column 26, line 19)

(4) regarding claim 38:

A receiver comprising:

one or more pre-processors (112 and 114 in figure 5) operative to receive and process the one or more signals to provide one or more streams of samples;



an equalizer (116 or 128) coupled to the one or more pre-processors and operative to receive, combine, and equalize the one or more streams of samples to generate symbol estimates; and

a post processor (396 in figure 37) coupled to the equalizer and operative to receive and process the symbol estimates to provide a first stream of recovered symbols).

(5) regarding claim 39:

further comprising:

one or more rake receivers (118 or 130) coupled to the one or more pre-processors and operative to receive and process the one or more streams of samples to generate a second stream of recovered symbols.

(6) regarding claims 40 and 52 (see rejection for claim 38):

a controller (120) operative to receive estimates of a signal quality associated with each of the first and second streams of recovered symbols, and selecting (124 and 122) the first or second processing based on estimated signal qualities associated therewith.

(8) regarding claim 42:

wherein the equalizer further includes a coefficient adjustment element coupled to the one or more filters and operative to adapt one or more sets of coefficients for the one or more filters (figures 11 and 33, column 25, line 41-column 26, line 19).

(9) regarding claim 43:

wherein the coefficient adjustment element is operative to adapt the set of

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coefficients for each filter based on the filtered samples received from the filter (figure 3, column 25, line 41-column 26, line 19).

(10) regarding claim 44:

wherein the coefficient adjustment element is operative to adapt the one or more sets of coefficients for the one or more filters based on the symbol estimates (figures 33, column 25, line 41-column 26, line 19).

(11) regarding claim 45:

a slicer (28) coupled to the summer (278) as recited in claim (figure 33).

(12) regarding claim 46:

wherein the coefficient adjustment element is operative to implement an adaptation algorithm selected from the group consisting of least mean square (LMS), recursive least square (RLS), and direct matrix inversion (DMI) algorithms (figure 33, column 25, line 41-column 26, line 19).

(13) regarding claim 47:

wherein the equalizer further includes one or more multipliers respectively coupled to the one or more filters, each multiplier operative to receive and multiply the filtered samples with a respective scaling factor to provide scaled samples, and wherein the summer couples to the one or more multipliers and is operative to receive and sum the scaled samples from the one or more multipliers to provide the symbol estimates (figure 33).

(14) regarding claim 51:

wherein the post processor includes a PN despreader operative to receive and

despread the symbol estimates with a PN sequence at a particular time offset to provide despread samples, and a decoder element coupled to the PN despreader and operative to decode the despread samples with one or more channelization codes to provide the first stream of recovered symbols (figure 1, pages 422-423).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Serizawa et al. (US 5283531) in view of Visotsky et al. (US 6175588).

Serizawa et al. discloses all of the subject matter as described above except for specifically teaching a PN despreader and a decoder element composed in the post processor as claimed.

Visotsky et al., in the same field of endeavor, teaches a processor comprising a despreader (106) and a decoder element (130) as recited in claim.

It would be desirable to have the high data rate and bandwidth efficiency in the communication system by using CDMA. One skilled in the art would have clearly recognized that in order to enable the mobile station to implement synchronous

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acquisition and tracking operations, a pilot signal is superimposed on the data symbol sequence. It is also well known that the orthogonal sequences currently used in CDMA system are Walsh codes of length 64. Walsh codes are used in forward CDMA link to separate users. In any given sector, each forward code channel is assigned a distinct Walsh code. The receiver despreads the chips by using the same Walsh code used at the transmitter so that the symbols or digits are recovered without any error. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the processor of Visotsky et al. with the desreader and the decoder to the demodulator of Serizawa et al. in order to allow the receiver to demodulate spread spectrum signal with high data rate and bandwidth efficiency. In so doing, the receiver facilitates the synchronization for demodulating of the spread spectrum signal so that the quality of the received data is improved. Furthermore, in so doing, the receiver facilitates separating different users from the composite spread signal so that the channel security is improved and the data can be recovered without errors.

***Allowable Subject Matter***

8. Claims 41 and 48-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Conclusion**

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shuwang Liu whose telephone number is (703) 308-9556.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin, can be reached at (703) 305-4714.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.



Shuwang Liu  
Primary Examiner  
Art Unit 2634

July 22, 2003